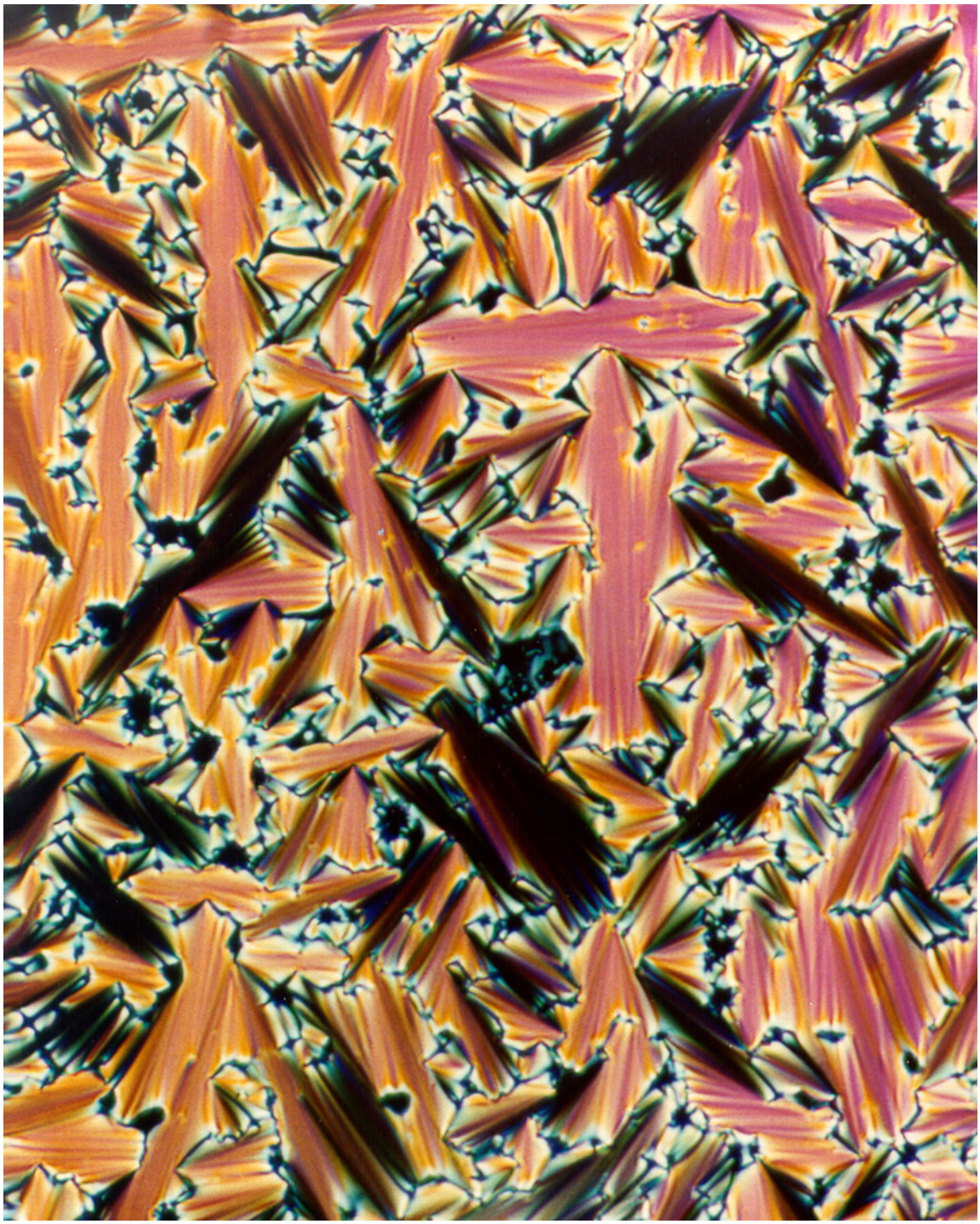

Ferroelectric Liquid Crystal

The picture shows a texture smectic A mesophase of a ferroelectric side-chain liquid crystal at 145 °C. The cell (4 μm thick) containing the sample is placed between crossed polarizers. The bistable electro-optic effect is achieved by applying an external electric field across the cell that switches the molecules from one tilt direction to the other as the field is reversed. This material exhibits a switching time of ~600 ms at room temperature to ~150 ms at 140 °C. Potential applications include display devices (e.g., flat TV screens), transducers, pyroelectric detectors, and nonlinear optic devices suitable for optical computers.